

REMARKS

Claims 1-4, 6, 8, 9 and 11-20 are pending in the application. In the Office action dated March 16, 2011, claims 1-4, 6, 8, 9 and 11-20 were rejected. In view of the following remarks, Applicants request reconsideration of the rejected claims under 37 C.F.R. § 1.111.

Rejections under 35 U.S.C. § 103

- Claims 1-2, 4, 6, 9, 11, and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Marumoto et al. (JP 08-67535, see machine translation).
- Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Marumoto et al. (JP 08-67535) in view of Yamada (U.S. Patent no. 3,876,479) as applied to claims 1, 2, 4, 6, 8, 9, 11, and 19 above, and further in view of Oboodi et al. (U.S. Patent no. 4,794,048).
- Claims 1, 12-18, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shi et al. (WO 00/28602) in view of Marumoto et al. (JP 08-67535) and further in view of Yamada et al. (U.S. Patent no. 3,876,479).
- Claims 12-18, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Marumoto et al. (JP 08-67535) as applied to claims 1, 2, 4-7, 11, and 19 above, in view of Shi et al. (WO 00/28602).

Before addressing the details of the rejections, Applicants suggest that it may be helpful to review the claimed invention. Claim 1 is directed to a method of texturing a glass surface. The claimed method includes:

- coating the glass surface with an aluminium film,
- stimulating a reaction between the glass and the aluminium film resulting in the formation of reaction products at an interface between the glass and the aluminium

film such that an interfacial surface of unreacted glass at the interface is textured, and

- removing the aluminium film and the reaction products from the glass surface by chemical etching.

The claim is explicit in reciting the application of an aluminum film to the glass surface, the reaction between the glass and the aluminum to create reaction products, and the removal of both the aluminum film and the formed reaction products by a process of chemical etching.

Marumoto et al.

In formulating the rejections under 35 U.S.C. § 103, the Office action asserts that it would have been obvious to one skilled in the art at the time of the invention to modify the method of Marumoto et al. by using metal such as aluminum for coating the glass substrate.

Applicants respectfully disagree.

In formulating the rejection, the Office action acknowledges that Marumoto et al. fails to teach coating the glass substrate with an aluminum film. However, the Examiner argues, unsupported by any evidence, that replacing the coating employed by Marumoto et al. with an aluminum film would be within the capability of one of ordinary skill in the art:

"it would have been obvious to one skilled in the art at the time the invention was made to modify the method of Marumoto et al. by using metal such as aluminum for coating the glass substrate, because Marumoto et al. explicitly suggests using metal coating ... and metal containing aluminum is suitable ... and such modification would involve nothing more than use of known material for its intended use in a known environment to accomplish entirely expected result."
(page 4, para 2 of the action)

The Examiner seeks to provide basis for the rejection by stating that "the courts have held that the selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art".

However, the Board of Patent Appeals and Interferences has also held that the mere assertion that a modification of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" is insufficient to establish *prima facie* obviousness without some objective reason to carry out the modification. This is true even where all aspects of the claimed invention were present in the prior art. (*Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993)).

In the present instance, the Office action provides no examples of the use of an aluminum film in a process of surface roughening as recited in claim 1. Instead, the action makes the broad assertion that because Marumoto et al. teaches the application of a metal film, the application of any metal would therefore be obvious. Applicants respectfully disagree.

The Marumoto et al. reference utilizes an applied metal film to physically remove portions of the glass surface, while the method of instant claim 1 utilizes an aluminum film to form interfacial reaction products, followed by chemical etching to produce the desired roughened surface. Applicants suggest that an assumption that any and all metals will function equivalently well in a mechanical process is unwarranted, but making the assumption that a metal will then function equivalently in a chemical process is absurd, given the unpredictable nature of the art of chemistry and in particular the highly variable nature of chemical reactivity among the broad family of metallic elements.

The Office action explicitly states that because the metal film of Marumoto et al. is suitable for the disclosed mechanical process of that reference, that the use of any other metal in the chemical process of claim 1 would be obvious, and involve "nothing more than the use of known material for its intended use in a known environment to accomplish entire expected result." Applicants respectfully disagree, and suggest that the chemical arts are sufficiently unpredictable that some articulated rationale, based upon the content of the prior art, is required to establish the *prima facie* obviousness of the process of claim 1.

Specifically, Applicants note that Marumoto et al. discloses the use of a nickel coating containing 5% aluminum. The Marumoto et al. reference fails to provide any implicit or explicit suggestion to increase the aluminum content of the nickel coating. In contrast, Marumoto et al. teach that:

"As a material of the coat 2 or the thermally sprayed film 4, semiconductor materials other than Ni + 5% aluminium shown in above-mentioned working example, such as Ceramics Sub-Division, such as other metallic materials, such as nickel and Mo, aluminium₂O₃, and Y₂O₃, ZnS, ZnO, etc. can be used." (see para. [0016])

There is not only no suggestion to increase the aluminum content of the film by Marumoto et al., but in the alternative metal coatings recited in that reference, pure aluminum is not explicitly suggested. Instead, a variety of other metallic materials are set out. Applicants respectfully suggest that one of ordinary skill in the art would be led by the Marumoto et al. reference itself to select one of the coatings specifically suggested by that reference, rather than making the arbitrary selection of an undisclosed alternative. A cited reference may be relied upon for all that it teaches one of ordinary skill, including suggestions that lead away

from the claimed invention (MPEP § 2143.01(II)).

Examiner's Response to Prior Arguments

In their previous response (dated November 30, 2010) Applicants argued that the Marumoto reference disclosed techniques for mechanically overcoming the adhesion power of coating 2, such that texturing of the surface of the substrate was achieved by "breaking off" pieces of the substrate via the shearing stress of the mechanical removal of coating 2. As claim 1 recited the removal of the aluminum film coating via chemical etching, a significant change to the principle of operation of the prior art, Applicants suggested that a rejection of claim 1 under 35 U.S.C. § 103 in view of Marumoto would be improper, and that therefore the *prima facie* obviousness of claim 1 had not been established.

In response to this argument, the Office action asserts that "Marumoto et al. teaches texturing a substrate by applying a metal coating on the substrate so that a reaction occurs between the substrate and the coating ... thereby texturing substrate" and "Marumoto et al. teaches removing the coating 2 to leave behind the textured substrate by mechanical removal method." However, the action goes on to state that "there is no where (sic) in Marumoto et al. describing texturing the substrate by breaking off pieces of the substrate as argued by Applicant" (see page 10, line 7 to page 11, line 10 of the Office action). Applicants respectfully disagree.

In their previous response, Applicants provided specific references to the machine translation of Marumoto et al., which forms the basis of the rejection. Specifically, at page 10, lines 10-18 of their previous response, Applicants made reference to paragraphs [0010], [0015], and [0016] of Marumoto et al. (in reference to the English translation). The relevant portions of

paragraphs [0010], [0015], and {0016} are reproduced below:

"And as shown in drawing 2, the coat 2 was removed from the glass substrate 1 surface by adhering the metal piece 3 to the surface of the coat 2 with adhesives, and pulling down this metal piece 3. This removed some glass substrates 1 stuck to the coat 2 with this coat 2, the rugged surface 1a was formed in the glass substrate 1 surface, and surface roughening of this glass substrate 1 surface was carried out." (para. [0010], emphasis added)

"If the adhesion power of the coat 2 is smaller than 4.0 MPa, when removing the coat 2 from the glass substrate 1, it becomes difficult to remove some glass substrates 1 with this coat 2, and surface roughening of the substrate 1 surface cannot be carried out effectively." (para. [0015], emphasis added)

"If the thickness of coat 2 is thinner than 25 micrometers, when removing the coat 2 from the glass substrate 1, the coat 2 will be torn easily, and it will become difficult to remove some glass substrates 1 with the coat 2." (para. [0015], emphasis added)

"as the method of removing the coat 2 from the glass substrate 1 surface – above – mentioned working example – “– pulling down – law – although” was adopted, it is also possible to adopt other methods, such as a “tension method” etc. which pulls the metal piece fixed by adhesives." (para. [0016], emphasis added)

Applicants reiterate that it is absolutely unambiguous that the principle of operation of the Marumoto invention resides in the application of a coating to the substrate followed by the physical and mechanical removal of that coating, which removal brings a portion of the substrate with the applied coating as it is removed, resulting in a roughened surface. In any event, the assertion within the Office action that Marumoto et al. fails to disclose texturing the substrate by breaking off pieces of the substrate is simply untrue.

Furthermore, the Office action asserts that "Marumoto et al. teaches texturing a substrate by applying a metal coating on the substrate so that a reaction occurs between the substrate and the coating ... thereby texturing substrate." This is simply incorrect. The Marumoto et al. reference fails to teach that the substrate surface is roughened by application of the metal coating. As stated above, the reference clearly discloses that the surface is roughened by the partial adhesion of the substrate material to the coating when it is physically removed. As stated in para. [0015] of Marumoto et al., if the adhesion of the coating to the substrate is too weak, then removal of the coating will fail to provide sufficient roughening of the surface. Applicants note that, if the mere application of the coating resulted in the desired surface texturing, then the adhesion power of the coating would be irrelevant, and not disclosed as a critical factor as it is in the Marumoto et al. reference. Applicants reiterate that Marumoto et al. clearly teach a physical and mechanical process for surface roughening.

The Office action then goes on to state that "It would have been obvious to one skilled in the art at the time the invention was made to modify the method of Marumoto et al. by using chemical etching step to remove the aluminum layer completely and leave only the substrate as taught by Yamada et al." and that "such modification would involve nothing more than use of known method for its intended use". Applicants emphatically disagree, for at least the following reasons.

As noted in Applicants' previous Response, if the proposed modification or combination of the prior art would change the principle of operation of a prior art invention being modified, then the references necessarily fails to provide sufficient suggestion or motivation to render the claims *prima facie* obvious (MPEP § 2143.01(VI)). The operating principle of Marumoto et al. is

the physical removal of coating 2, with the concomitant removal of some glass substrate adhered to that coating. Replacing this process with a chemical etching step would change the principle of operation from a physical and mechanical process to a chemical process. Applicants reiterate that Marumoto et al. is improperly cited as a reference under 35 U.S.C. § 103, and therefore it cannot be relied upon to establish the obviousness of claim 1 under 35 U.S.C. § 103.

Furthermore, as Marumoto et al. teaches that it is the physical removal of the applied coating that produces surface roughening, then in the absence of such a physical removal, one of ordinary skill would not expect the surface to become roughened. That is, a person of ordinary skill presented with the Marumoto et al. disclosure would not consider a chemical etching removal method, as it is not a method which "pulls the metal piece fixed by adhesive." To do so would not be "a known method for its intended use in a known environment to accomplish entirely expected result," but would instead constitute an entirely different process, one that depended upon the chemical reactivity of the components involved, and could not therefore be considered *prima facie* obvious.

Yamada et al.

While the Office action acknowledges that the Marumoto et al. reference does not specifically disclose removing an aluminum film and reaction products from a glass substrate by one or more chemical etching steps, the action asserts that Yamada et al. discloses the removal of an aluminum foil by chemical etching (see page 5, lines 3-13 of the Office action).

As discussed above, Applicants respectfully suggest that one of ordinary skill in the art would not turn to Yamada et al. for guidance to modify Marumoto et al. by removing the metal coating of Marumoto using one or more chemical etching steps. Marumoto et al. explicitly

requires the removal of the metal film by physically pulling it from the glass surface: "it is also possible to adopt other [removing the coat 2 from the glass substrate 1 surface] methods, such as a "tension method" etc, which pulls the metal piece fixed by adhesives." (para. [0016] of Marumoto et al., emphasis added).

Furthermore, and as discussed above, the disclosure of Marumoto et al. unambiguously states that texturing is achieved by removal of parts of the glass substrate adhered to the coating 2 (i.e. mechanical breaking-off "texturing method"). As Marumoto et al. requires as an essential feature of their disclosed technique "pulling the metal piece fixed by adhesives" so that "some glass substrates 1 is removed with the coat 2", an artisan of ordinary skill in the art would not turn to Yamada et al. and modify Marumoto et al. to achieve removal by one or more chemical etching steps, as this would change the principle of operation of the Marumoto et al. reference.

Additionally, it is significant to note that the Yamada et al. reference does not teach the texturing of the synthetic resin substrate as a result of the chemical etching removal of the aluminum foil. Rather, Yamada et al. discloses at col. 4, lines 33-62, and in conjunction with the figure, that:

"It will be recognized from the photograph that the surface (of the pre-treated) is in extremely complicated roughened state. It is clear that the irregularities on the surface of etched aluminium foil are not only complicated, but also suitable for the resin entering thereinto. Therefore, when a synthetic resin is superposed on the surface of this aluminium foil and the assembly is heated and pressed, the resin deeply enters into the holes on the surface of the foil. After the resin is cured at this state, the aluminium foil is removed by chemical etching to obtain a synthetic resin substrate having a surface which has complicated irregularities corresponding to those on the surface of the etched aluminum foil."

Therefore, and significantly, removal of the (pre-treated) aluminum foil serves only to remove the foil, and does not texture the synthetic resin. The texturing is achieved by the synthetic resin conforming to the existing surface of the (pre-treated) aluminum foil. That is, the pre-treated aluminum foil functions as a mould for the synthetic resin, which then takes on a topography that is the negative of the foil surface. Even in combination with the Yamada et al. reference, the Marumoto et al. references fails to disclose the chemical etching of a glass surface to produce a roughened surface.

Conclusion

In order to establish the *prima facie* obviousness of a claim, the prior art must disclose each and every element of the claim, the prior art must provide some rationale for combining and/or modifying the references as suggested, and the prior art must provide some reasonable expectation of success.

For at least the reasons set out above, Applicants suggest that the Marumoto et al. and Yamada et al. references fail to provide each and every element of the claim, fail to provide an adequate and articulated rationale for combining and modifying the references, and therefore necessarily fail to provide a reasonable expectation of success of the claimed invention. Furthermore, Applicants suggest that further combination with one or more of the Oboodi et al. and Shi et al. fails to remedy the deficiencies in the Marumoto et al. and Yamada et al. references.

Applicants therefore respectfully request the withdrawal of the rejection of claim 1 under 35 U.S.C. § 103.

Claims 2-4, 6, 8, 9 and 11-20 depend directly or indirectly from claim 1. Therefore, Applicants suggest that those claims are patentable for at least the same reasons as provided above for claim 1, and respectfully request the withdrawal of the rejection of claims 2-4, 6, 8, 9, and 11-20 under 35 U.S.C. § 103.

Applicants believe that in view of the above amendments and remarks, the application is in condition for allowance. If any questions remain, or if a telephone interview would in any way advance prosecution of the application, the Examiner is respectfully requested to contact the undersigned agent of record.

Respectfully submitted,

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